

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1-13.(Canceled)

14.(Currently Amended) A method ~~for~~ of fabricating a PIN radiation detector device comprising:

~~—— forming electrical circuitry on a wafer portion of a substrate, the substrate having a handle portion, an oxide material portion, a bonding material portion and the wafer portion;~~

~~—— removing the entire handle portion; and~~

~~—— removing the oxide material portion thereby exposing at least a part of the bonding material portion.~~

providing a substrate comprising an intrinsic active layer, a handle layer, a contact layer having a first electrical conductivity type disposed between the active layer and the handle layer, and a buried oxide layer disposed between the contact layer and the handle layer;

removing a portion of the active layer to expose a first surface of the contact layer;

introducing a material having a second electrical conductivity type within the active layer at a detector site, said material separated from the contact layer by at least a portion of the intrinsic active layer; and

forming a first electrically conductive terminal to electrically couple with the contact layer at the first surface and a second electrically conductive terminal to electrically couple with the said material.

15-16.(Canceled)

17.(Currently Amended) The method ~~as claimed in Claim 14~~ of claim 14, wherein the ~~forming step further comprises:~~

forming ~~detector site~~ comprises a PIN diode areas in the wafer portion ~~detector~~ coupled in common with other PIN diode detectors via said contact layer.

18-21.(Canceled)

22.(Currently Amended) The method ~~as claimed in Claim 14~~ of claim 23, wherein the entire handle ~~layer~~ portion is removed in a single process step.

23.(New) The method of claim 14, further comprising:
hybridizing the substrate via at least said first and second electrically conductive terminals; and
after hybridizing, removing at least a portion of the handle and buried oxide layers, thereby exposing at least a portion of a second surface of the contact layer, said second surface being a radiation receiving surface.

24.(New) The method of claim 23, wherein hybridizing the substrate comprises hybridizing the substrate to a read out integrated circuit.

25.(New) The method of claim 23 wherein removing at least a portion of the handle and buried oxide layers comprises etching to the buried oxide layer and separately removing at least a portion of the buried oxide layer.

26.(New) The method of claim 14, wherein the first electrical conductivity type comprises n-type, and the second electrical conductivity type comprises p-type.

27.(New) A product made by the process of claim 14.

28.(New) The method of claim 14, wherein providing a substrate comprises providing the handle layer with the buried oxide layer, bonding an n-type contact layer to the buried oxide layer, and disposing the intrinsic active wafer layer over the contact layer.

29.(New) The method of claim 14, wherein the contact layer has a thickness between about 0.01 microns and about 5 microns.

30.(New) A method of fabricating an array of p-intrinsic-n detector devices comprising:

making an opening through an intrinsic active layer of a substrate to expose a first surface of an embedded contact plate having a first electrical conductivity type, where the substrate further comprises a handle layer wherein the contact plate is disposed between the handle layer and the active layer;

introducing into the intrinsic active layer a material of a second electrical conductivity type at each of a plurality of detector sites such that at least a portion of the active layer lies between the material and the contact layer at each detector site;

forming at least one first conductive bump that is electrically coupled to the first surface of the contact plate;

forming a plurality of second conductive terminals, individual ones of which are electrically coupled to the material at an individual one of the plurality of detector sites;

hybridizing the substrate to a read out integrated circuit through the conductive bumps;

after hybridizing, removing at least some of the handle layer to expose a second surface of the contact layer facing opposite the active layer, said second surface being a radiation receiving surface.

31.(New) The method of claim 30, wherein the first electrical conductivity type comprises n-type, and the second electrical conductivity type comprises p-type.

32.(New) A product made by the process of claim 30.